

**Unit 1... Connections to Algebra (Keystone Review)****Part 1.1 – Using Variables**\_\_\_\_\_ 1) Which is an algebraic expression for “six less than  $k$ ”?

A)  $\frac{6}{k}$

B)  $\frac{k}{6}$

C)  $6 - k$

D)  $k - 6$

\_\_\_\_\_ 2) Which is an algebraic expression for “the product of  $a$  and 10”?

A)  $a + 10$

B)  $a - 10$

C)  $10a$

D)  $\frac{a}{10}$

\_\_\_\_\_ 3) Which is an algebraic expression for “9 more than  $v$ ”?

A)  $v + 9$

B)  $v - 9$

C)  $9 - v$

D)  $9v$

\_\_\_\_\_ 4) A container of milk contains 64 ounces. Which equation models the number  $n$  of ounces remaining after you have drunk  $m$  ounces?

A)  $m - 64 = n$

B)  $64 - m = n$

C)  $n - 64 = m$

D)  $n - m = 64$

\_\_\_\_\_ 5) Which equation models the relationship in the table if  $r$  represents the row number and  $t$  represents the number of tulips?

A)  $r = 3t$

B)  $\frac{r}{t} = 3$

C)  $t = r + 3$

D)  $t = 3r$

Row Number	Number of Tulips
1	3
2	6
3	9
4	12

\_\_\_\_\_ 6) Which is an algebraic expression for “the quotient of  $r + 5$  and  $b$ ”?

A)  $\frac{r + 5}{b}$

B)  $\frac{r}{b + 5}$

C)  $\frac{b}{r + 5}$

D)  $\frac{b}{r} + 5$

**Part 1.2 – Exponents and Order of Operations**\_\_\_\_\_ 7) Simplify:  $5^3 - 15 \div 2 + 2$ 

A) 2

B) 57

C) 112

D) 119.5

\_\_\_\_\_ 8) Simplify:  $8(5-3)^3 + 9$

- A) 73                      B) 57                      C) 40                      D) 22

\_\_\_\_\_ 9) Evaluate  $2ab + c$  for  $a = 3.3$ ,  $b = 4.5$ , and  $c = 2$ .

- A) 18.4                      B) 31.7                      C) 32.8                      D) 41.6

\_\_\_\_\_ 10) Evaluate  $(r-s)^2$  for  $r = 9$  and  $s = 6.5$ .

- A) 2.5                      B) 3.5                      C) 6.25                      D) 12.25

\_\_\_\_\_ 11) A shirt is on sale for \$25 at the local department store. There is also 4% sales tax. What is the total cost of the shirt, including the sales tax?

- A) \$25                      B) \$26                      C) \$29                      D) \$35

\_\_\_\_\_ 12) You can find the distance  $d$  an object falls in feet for time  $t$  in seconds using the formula  $d = 16t^2$ . Suppose a ball is dropped out of a window of a tall building. How far will the ball fall in 3 seconds?

- A) 144 ft                      B) 96 ft                      C) 48 ft                      D) 16 ft

### **Part 1.3 – Exploring Real Numbers**

\_\_\_\_\_ 13) Which number has the same value as  $-\left|-\frac{3}{4}\right|$ ?

- A)  $-0.75$                       B)  $-0.34$                       C)  $0.34$                       D)  $0.75$

\_\_\_\_\_ 14) Which group of numbers is ordered from least to greatest?

- A)  $-0.7, -\frac{3}{4}, -1$       B)  $-1, -\frac{3}{4}, -0.7$       C)  $-1, -0.7, -\frac{3}{4}$       D)  $-\frac{3}{4}, -0.7, -1$

\_\_\_\_\_ 15) Suppose  $a$  is a nonzero integer. Which statement is never true?

- A)  $a > -a$                       B)  $a < -a$                       C)  $|a| = -a$                       D)  $|a| = -|a|$

\_\_\_\_\_ 16) Which number is NOT an integer?

- A)  $-10$                       B)  $-\frac{2}{3}$                       C)  $0$                       D)  $5$

\_\_\_\_\_ 17) Suppose your brother says that fractions are rational numbers, but fractions are not integers. Which number is a counterexample for this statement?

A)  $\frac{10}{3}$

B)  $\frac{5}{3}$

C)  $-\frac{5}{3}$

D)  $-\frac{9}{3}$

\_\_\_\_\_ 18) Which set of numbers is most reasonable to use to describe the area of your kitchen floor?

A) whole numbers

B) integers

C) rational numbers

D) real numbers

### **Part 1.4 – Adding Real Numbers**

\_\_\_\_\_ 19) Simplify:  $10 + |-3| + (-3)$

A) 16

B) 10

C) 7

D) 4

\_\_\_\_\_ 20) Evaluate  $(3a + b) + (-20)$  for  $a = 5$  and  $b = -1$ .

A)  $-6$

B)  $-2$

C) 20

D) 22

\_\_\_\_\_ 21) Which expression has a value different from the others?

A)  $-7 + 3$

B)  $5 + (-9)$

C)  $-8\frac{2}{3} + 4\frac{2}{3}$

D)  $-9 + 13$

\_\_\_\_\_ 22) In a 12-hour period, the temperature rose from  $-12^{\circ}\text{F}$  to  $18^{\circ}\text{F}$ . Find the increase in temperature in degrees?

A) 30

B) 6

C)  $-6$

D)  $-30$

\_\_\_\_\_ 23) The value of  $-(-(-27)))$  is NOT the same as which expression?

A)  $-29 + 2$

B)  $-12.8 + (-14.2)$

C)  $-42 + 17$

D)  $8 + (-35)$

\_\_\_\_\_ 24) Suppose you have \$95 in your checking account. You pay for a \$34 sweater using your debit card. Then you deposit a \$32 check. Later, you withdraw \$16 at the supermarket. What is the balance in your account?

A) \$145

B) \$81

C) \$77

D) \$13

### **Part 1.5 – Subtracting Real Numbers**

\_\_\_\_\_ 25) Evaluate  $-|a - b| + |c|$  for  $a = -3$ ,  $b = 4$ , and  $c = -4$ .

- A) 11                      B) 3                      C)  $-3$                       D)  $-11$

\_\_\_\_\_ 26) Which expression has a value different from the others?

- A)  $-7-12$                       B)  $17-12$                       C)  $12-7$                       D)  $12+(-7)$

\_\_\_\_\_ 27) Find the next number in the pattern 11, 8, 5, 2, ...

- A) 1                      B) 0                      C)  $-1$                       D)  $-2$

\_\_\_\_\_ 28) One January day, the temperature at noon is  $8^{\circ}\text{F}$ . During the afternoon, the temperature drops 5 degrees. By dawn, the temperature has fallen another 9 degrees. What is the temperature at dawn?

- A) 11                      B) 6                      C)  $-6$                       D)  $-11$

### **Part 1.6 – Multiplying and Dividing Real Numbers**

\_\_\_\_\_ 29) Simplify:  $(-3)(-3)(2)(2)(-1)$

- A)  $-36$                       B)  $-6$                       C) 6                      D) 36

\_\_\_\_\_ 30) Evaluate  $-ac+bc$  for  $a=-2$ ,  $b=6$ , and  $c=-3$ .

- A)  $-24$                       B)  $-6$                       C) 6                      D) 24

\_\_\_\_\_ 31) A Mach number  $M$  indicates the speed of a supersonic airplane. You can find an airplane's speed  $a$  in miles per hour using the formula  $a = Ms$  where  $s$  is the speed of sound at the altitude of the airplane. Find an airplane's speed in miles per hour if the airplane travels at Mach 2.5 at an altitude where the speed of sound is 710 mi/h.

- A) 177.5 mi/h                      B) 284 mi/h                      C) 1775 mi/h                      D) 2840 mi/h

\_\_\_\_\_ 32) Which expression does NOT have the same value as  $-11+(-11)+(-11)+(-11)$ ?

- A)  $-44$                       B)  $4(-11)$                       C)  $(-11)^4$                       D)  $33-77$

\_\_\_\_\_ 33) Use the table below. What was the average temperature for the week?

Day	Mon.	Tue.	Wed.	Thur.	Fri.	Sat.	Sun.
Temperature	$-3^{\circ}\text{F}$	$4^{\circ}\text{F}$	$-2^{\circ}\text{F}$	$-5^{\circ}\text{F}$	$-3^{\circ}\text{F}$	$1^{\circ}\text{F}$	$1^{\circ}\text{F}$

- A)  $-7^{\circ}\text{F}$                       B)  $-1^{\circ}\text{F}$                       C)  $1^{\circ}\text{F}$                       D)  $4^{\circ}\text{F}$

**Part 1.7 – The Distributive Property**

\_\_\_\_\_ 34) Which expression is another form of  $14x - 21x$ ?

- A)  $-7x^2$                       B)  $7x^2(2 - 3x)$                       C)  $7x(2x - 3)$                       D)  $-7x$

\_\_\_\_\_ 35) Which expression is another form of  $-6(k - 5)$ ?

- A)  $-6k^2 - 30k$                       B)  $-6k + 30$                       C)  $-6k^2 - 5$                       D)  $-6k^2 + 5$

\_\_\_\_\_ 36) Simplify:  $7q + 8pq - 4qp - 9q$

- A)  $-2q + 12pq$                       B)  $16q + 4pq$                       C)  $-2q + 4pq$                       D)  $16q + 12pq$

\_\_\_\_\_ 37) A notebook costs \$1.89 at the school store. How much would notebooks for a class of 30 students cost?

- A) \$59.70                      B) \$59.67                      C) \$57.30                      D) \$56.70

**Use the table below for exercises 38-41.**

Category	130-Mile Race		350-Mile Race	
	Number Started	Number Finished	Number Started	Number Finished
Bicycle	51	41	24	16
Foot	43	37	11	9
Ski	9	6	3	3

\_\_\_\_\_ 38) Which category had the most competitors in each race?

- A) bicycle                      B) foot                      C) ski                      D) all of them

\_\_\_\_\_ 39) What percent of the competitors on bicycles completed the 350-mile race?

- A) 67%                      B) 75%                      C) 80%                      D) 82%

\_\_\_\_\_ 40) What percent of the competitors completed any of the 130-mile races?

- A) 67%                      B) 75%                      C) 80%                      D) 82%

\_\_\_\_\_ 41) Rocky Balboa won the 130-mile race on his bicycle. He finished in 11 hours and 45 minutes. What was his average speed in miles per hour?

- A) 11.8mph                      B) 11.4mph                      C) 11.1mph                      D) 10.8mph

## Part 1.8 – Properties of Real Numbers

\_\_\_\_\_ 42) Given the following, name the property:  $a + (b + c) = (a + b) + c$

- A) associative      B) commutative      C) distributive      D) additive identity

\_\_\_\_\_ 43) Which of the following has the same result as dividing a number by  $\frac{5}{2}$  and then multiplying by  $\frac{1}{2}$ ?

- A) multiplying by 2      B) dividing by 2      C) multiplying by 5      D) dividing by 5

\_\_\_\_\_ 44) Identify the real number property in the following expression:  $3 \cdot -5 = -5 \cdot 3$

- A) associative                      B) commutative
- C) distributive                  D) multiplicative identity

\_\_\_\_\_ 45) In the formula  $A = \pi r^2$ , if the value of  $r$  is doubled, then what is the value of  $A$  multiplied by?

- A)  $\frac{1}{4}$                       B)  $\frac{1}{2}$                       C) 2                      D) 4

\_\_\_\_\_ 46) Which one of these steps can be used to solve the equation  $\frac{4}{5}x = 20$ ?

- I. Multiply by  $\frac{5}{4}$                       II. Multiply by  $\frac{4}{5}$
- III. Divide by  $\frac{5}{4}$                       IV. Divide by  $\frac{4}{5}$

- A) II only                      B) IV only                      C) I and IV                      D) II and III

\_\_\_\_\_ 47) What is the total cost if you buy 3 goldfish for \$1.90 each, 3 angelfish for \$6.10 each, and 12 neon tetras for \$1.53 each?

- A) \$39.36                      B) \$42.36                      C) \$60.36                      D) \$66.36

\_\_\_\_\_ 48) Identify the real number property in the following expression:  $21 + 28y = 7(3 + 4y)$

- A) associative                      B) commutative
- C) distributive                  D) multiplicative identity



\_\_\_\_\_ 58) Evaluate  $\frac{2(x^2+18)}{x}$  for  $x = 4$ .

A) 17

B) 11

C) 8.5

D) 68

\_\_\_\_\_ 59) Simplify:  $|18.4 - 32.1|$

A) 13.7

B) -13.7

C) 23.3

D) 4.3

\_\_\_\_\_ 60) Which of the following is a rational number?

A)  $\pi$

B)  $\sqrt{7}$

C)  $\sqrt{\frac{20}{10}}$

D) 0.66666...

\_\_\_\_\_ 61) Evaluate  $|p| - |3q|$  for  $p = -2$  and  $q = 3$ .

A) -11

B) 7

C) -7

D) 11

\_\_\_\_\_ 62) Which situation is best represented by the expression  $2c - 5$ ?

A) Alicia walked 2 miles fewer than 5 times the number of miles,  $c$  Courtney walked.

B) Alicia walked 5 miles fewer than 2 times the number of miles,  $c$ , Courtney walked.

C) Alicia walked 2 more than 5 times the number of miles,  $c$ , Courtney walked.

D) Alicia walked 5 more than 2 times the number of miles,  $c$ , Courtney walked.